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**REMARKS**

The Office action dated October 20, 2004 and the cited references have been carefully considered.

**Status of the Claims**

Claims 1 and 3-29 are pending.

Claims 1, 5, 17, and 25-26 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Examiner alleged that the limitation of a positive thermal strain has not been described in the specification. The Applicants respectfully traverse this rejection for the reasons set forth below.

Claims 5, 8-11, 13-16, and 25-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Budhani article entitled "Thin Film Temperature Sensors for Gas Turbine Engine: Problems and Prospects" (hereinafter "Budhani") in view of JP 410034825A (hereinafter "JP '825"). Claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Budhani in view of JP '825 and EP 0908713A1 (hereinafter "EP '713"). Claims 28 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Budhani in view of JP '825 and Chapman et al. (U.S. Patent 6,568,848; hereinafter "Chapman"). Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Rimai et al. (U.S. Patent 5,411,600; herein after "Rimai") in view of JP '825. The Applicants respectfully traverse all of these rejections for the reasons set forth below.

Claims 1, 3-4, and 17-24 would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C § 112, first paragraph, above. The Applicants wish to thank the Examiner for indicating that claims 1, 3-4, and 17-24 are allowable, and will address the rejection under 35 U.S.C. § 112, first paragraph, below.

**Claim Rejection Under 35 U.S.C. § 112, First Paragraph**

Claims 1, 5, 17, and 25-26 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Examiner alleged that the limitation of a positive thermal strain has not been described in the specification. The Applicants respectfully traverse this rejection because the original specification discloses thermal expansion coefficient data on many suitable dielectric materials in Table 1. These

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data can be used with data on thermal expansion coefficient of superalloy, such as that disclosed in paragraph 0021, to calculate thermal strains for various possible combinations of this superalloy and these dielectric materials. All of these calculated thermal strains are positive. For example, paragraph 0021 discloses examples of the pair of Ni-based superalloy and alumina and of Ni-based superalloy and MgO. For example, for a temperature increase of 725 °C and the pair of Ni-based super alloy and alumina, the thermal strain is calculated as:

$(16 \times 10^{-6} - 7.1 \times 10^{-6}) (^{\circ}\text{C}^{-1}) \times 725 ^{\circ}\text{C} = 6.4 \times 10^{-3}$  ( $16 \times 10^{-6}$  and  $7.1 \times 10^{-6} ^{\circ}\text{C}^{-1}$  are thermal expansion coefficients of Ni-based superalloy and alumina, respectively, from paragraph 0021 and Table 1)

For a temperature increase of 1200 °C and the pair of Ni-based super alloy and MgO, the thermal strain is calculated as:

$(16 \times 10^{-6} - 11.5 \times 10^{-6}) (^{\circ}\text{C}^{-1}) \times 1200 ^{\circ}\text{C} = 5.4 \times 10^{-3}$  ( $16 \times 10^{-6}$  and  $11.5 \times 10^{-6} ^{\circ}\text{C}^{-1}$  are thermal expansion coefficients of Ni-based superalloy and MgO, respectively, from paragraph 0021 and Table 1)

It is evident that all other combinations of numbers give positive thermal strains. Therefore, the limitation of positive thermal strains is fully disclosed in the original specification. Consequently, claims 1, 5, 17, and 25-26 recite limitations that are already described in the original specification, and fully comply with 35 U.S.C. § 112, first paragraph, and these claims are now in condition for allowance.

#### **Claim rejection Under 35 U.S.C. § 103(a)**

Claims 5, 8-11, 13-16, and 25-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Budhani JP '825. The Applicants respectfully traverse this rejection because a combination of Budhani and JP '825 does not teach or suggest a positive thermal strain less than 0.006, as the term thermal strain is defined in the instant application.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. § 2143.03 (8<sup>th</sup> ed., Rev. 2, May 2004).

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JP '825 teaches only that materials are chosen such that the bonded layers have zero thermal stress. The Examiner even admitted this (see, Office action, page 4, second full paragraph). The Examiner wrongfully asserted that a zero number is a positive number. "Positive" is defined as "numerically greater than zero" (Webster's Third New International Dictionary of the English language Unabridged, G. & C. Merriam Co., Pub., 1968 (emphasis added)) and "having value greater than zero" (McGraw-Hill Dictionary of Scientific and Technical Terms, 5<sup>th</sup> ed., McGraw-Hill, Inc., New York, 1994 (emphasis added)). Thus, JP '825 does not teach or suggest a positive thermal strain, as is recited in claims 5, 8-11, 13-16, and 25-25. Adding Budhani to show thermocouple films of Pt/Rh on film of NiCoCrAlY and Al<sub>2</sub>O<sub>3</sub> still does not teach or suggest a positive thermal strain less than 0.006, as is recited in claims 5, 8-11, 13-16, and 25-25.

Since a combination of Budhani and JP '825 does not teach or suggest all of the limitations of each of claims 5, 8-11, 13-16, and 25-25, these claims are patentable over Budhani in view of JP '825.

Claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Budhani in view of JP '825 and EP '713. The Applicants respectfully traverse this rejection because a combination of Budhani, JP '825, and EP '713 does not teach or suggest a positive thermal strain less than 0.006, as the term thermal strain is defined in the instant application.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. § 2143.03 (8<sup>th</sup> ed., Rev. 2, May 2004).

As pointed out above JP '825 does not teach or suggest a positive thermal strain, as is recited in claims 6 and 7. Adding Budhani to show thermocouple films of Pt/Rh on film of NiCoCrAlY and Al<sub>2</sub>O<sub>3</sub> and adding EP '713 to show a protective alumina coating or an insulating material between two thermocouple legs still do not teach or suggest a positive thermal strain less than 0.006, as is recited in claims 6 and 7.

Since a combination of Budhani, JP '825, and EP '713 does not teach or suggest all of the limitations of each of claims 6 and 7, these claims are patentable over Budhani in view of JP '825 and EP '713.

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Claims 28 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Budhani in view of JP '825 and Chapman. The Applicants respectfully traverse this rejection because a combination of Budhani, JP '825, and Chapman does not teach or suggest a positive thermal strain less than 0.006, as the term thermal strain is defined in the instant application.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. § 2143.03 (8<sup>th</sup> ed., Rev. 2, May 2004).

As pointed out above JP '825 does not teach or suggest a positive thermal strain, as is recited in claims 28 and 29. Adding Budhani to show thermocouple films of Pt/Rh on film of NiCoCrAlY and Al<sub>2</sub>O<sub>3</sub> and adding Chapman to show an RF signal transmission still do not teach or suggest a positive thermal strain less than 0.006, as is recited in claims 28 and 29.

Since a combination of Budhani, JP '825, and Chapman does not teach or suggest all of the limitations of each of claims 28 and 29, these claims are patentable over Budhani in view of JP '825 and Chapman.

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Rimai in view of JP '825. The Applicants respectfully traverse this rejection because a combination of Rimai and JP '825 does not teach or suggest a positive thermal strain less than 0.006, as the term thermal strain is defined in the instant application.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. § 2143.03 (8<sup>th</sup> ed., Rev. 2, May 2004).

As pointed out above JP '825 does not teach or suggest a positive thermal strain, as is recited in claims 28 and 29. Adding Rimai to show a metal layer extending beyond an insulation layer still does not teach or suggest a positive thermal strain less than 0.006, as is recited in claim 12. The Examiner even admitted that Rimai does not teach the particular thermal strain between the substrate and the non-conducting layer as stated in claim 12 (Office action, page 7, second full paragraph).

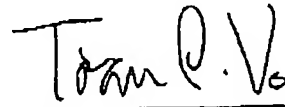
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Since a combination of Rimai and JP '825 does not teach or suggest all of the limitations of claim 12, this claim is patentable over Rimai in view of JP '825.

In view of the above, it is submitted that the claims are patentable and in condition for allowance. Reconsideration of the rejection is requested. Allowance of claims at an early date is solicited.

Respectfully submitted,



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Schenectady, New York  
December 14, 2004